Session 1A: *Cladophora* and its Impacts: Ecological Links, Monitoring, Pathogens, and Management Implications

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Linking *Cladophora* growth to mussel metabolism and nearshore hydrodynamics

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The resurgence of *Cladophora* in Lake Michigan has coincided with the establishment of dreissenid mussels in the lake, and it has been hypothesized that mussels have been instrumental in promoting *Cladophora* growth. We evaluate this hypothesis by using a numerical model to simulate *Cladophora* growth under pre- and post-mussel conditions. Model simulations suggest that the primary cause of increased algal production is the increase in water clarity resulting from filtration by dreissenids. However, *Cladophora* are only able to take advantage of increased water clarity because of the supply of dissolved P from mussels. To better understand the relationship between mussels and *Cladophora*, we have developed a mussel model that simulates P excretion as a function of food supply, mussel population structure, and temperature. Simulations with the linked *Cladophora* and mussel models indicate that mussel P excretion results in a higher optimal growth temperature for *Cladophora*. Ultimately, mussel P excretion is limited by food supply, which is driven to a large extent by nearshore-offshore mixing. Better measurements of horizontal mixing are required to assess the impact of mussels on *Cladophora* growth in the nearshore zone and plankton abundance in offshore waters.

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